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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,170	07/11/2001	Shinji Nakanishi	L7016.01121	8114

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[REDACTED] EXAMINER

CANTELMO, GREGG

[REDACTED] ART UNIT [REDACTED] PAPER NUMBER

1745

DATE MAILED: 06/24/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/889,170	NAKANISHI ET AL. <i>[Signature]</i>
	<b>Examiner</b>	<b>Art Unit</b>
	Gregg Cantelmo	1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
 THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
 a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

2. The information disclosure statement filed July 11, 2001 has been placed in the application file and the information referred to therein has been considered as to the merits.

### ***Drawings***

3. The drawings received July 11, 2001 are acceptable for examination purposes.

### ***Claim Objections***

4. Claims 5-10 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot rely upon a preceding multiple dependent claim (in this case claim 4). See MPEP § 608.01(n). Claims 5-10 have been further treated on the merits.

### ***Claim Rejections - 35 USC § 103***

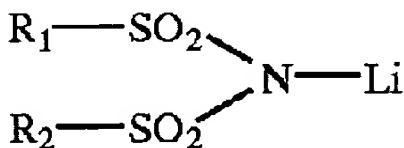
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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 886334-A (EP '334) in view of JP 07-192721-A (JP '721).

EP '334 discloses of a lithium secondary battery (page 2, line 3) comprising a positive electrode containing as an active material a lithium-containing composite transition metal oxide or a lithium-containing composite transition metal oxide (page 2, lines 28-32) in which a metal element other than the transition metal constituting the lithium-containing composite transition metal oxide is contained in the form of solid solution (page 2, lines 28-32 and 53-57); a negative electrode (page 2, line 33); and a non-aqueous electrolyte containing a solvent and an electrolyte salt containing at least one salt selected from the group of fluorine-containing inorganic anion lithium salts comprising LiPF<sub>6</sub>, LiBF<sub>4</sub>, LiAsF<sub>6</sub> and LiSbF<sub>6</sub> (page 2, lines 17-24) and at least one salt selected from lithium imide salts represented by the following formula (1):



(wherein R<sub>1</sub> and R<sub>2</sub> are independent of one another and represent C<sub>n</sub>X<sub>2n+1</sub> or C<sub>n</sub>X<sub>2n-1</sub> in which n is an integer of 1 to 8 and X is a hydrogen atom or a halogen atom) (page 2, lines 17-24 as applied to claim 1).

The concentration of the lithium imide salt in the non-aqueous electrolyte is not less than 0.003 mol/l and not more than 0.50 mol/l (page 3, lines 40-44 as applied to claim 2).

The concentration of the lithium imide salt in the non-aqueous electrolyte is not less than 0.003 mol/l and not more than 0.25 mol/l (page 2, lines 21-24 and Table 2 as applied to claim 3).

The fluorine-containing inorganic anion lithium salt is LiPF<sub>6</sub> and the lithium imide salt is LiN(CF<sub>3</sub>SO<sub>2</sub>)<sub>2</sub> (page 2, lines 21-24 and Table 1 example A1 as applied to claim 4).

The negative electrode is mainly composed of a carbon capable of absorbing and releasing lithium and having a spacing (d002) of lattice planes (002) of not more than 3.37 Angstroms and a size (Lc) of crystallites in the direction of axis c of not less than 200 Angstroms (page 2, lines 33-39 as applied to claim 5).

The solvent contains at least a cyclic carbonic acid ester, a cyclic carboxylic acid ester, a non-cyclic carbonic acid ester or an aliphatic carboxylic acid ester (page 2, lines 40-46 and page 3, lines 40-43 as applied to claim 6).

The total concentration of the electrolyte salts in the non-aqueous electrolyte is not less than 0.5 mol/l and not more than 2 mols/l (page 3, line 40) and the solvent contains at least ethylene carbonate, butylene carbonate,

vinylene carbonate or  $\gamma$ -butyrolactone (page 2, lines 40-46, page 3, lines 40-42 and Table 3 as applied to claim 7).

The total concentration of the electrolyte salts in the non-aqueous electrolyte is not less than 0.5 mol/l and not more than 2 mols/l, and the solvent contains at least ethylmethyl carbonate, diethyl carbonate or dimethyl carbonate (page 2, lines 40-46; page 3, lines 40-42 and Table 3 as applied to claim 8).

The difference between EP '334 and instant claim 1 is that EP '334 does not teach or suggest of said positive electrode further comprises one or more of metals of Groups IIA, IIIB, IVB, VB and VIB and lanthanide elements in the periodic table and compounds of these metals (claim 1) of a selected number of species of elements from the genus in claim 1 (claim 9) of a selected number of species of elements from the genus of claim 1 at a particular content (claim 10).

JP '721 teaches of adding elements such as Mg, Ca, Ti, Va, Cr to a lithium compound positive electrode composition (abstract and prior art claim 1 as applied to claims 1 and 9).

The amount of the additive element to the active material in the positive electrode is 0.1-20-mol per 100 mol of positive active material (paragraph [0010]) a portion of this range encompasses the ppm relationship of claim 10).

The motivation for adding elements such as Mg, Ca, Ti, Va, Cr to a lithium compound positive electrode composition is that it reduces the decomposition of the electrolyte at the time of storage at high temperatures, improves the reduces the increases in inside resistance of the battery and enhances the storing characteristics (abstract).

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Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '334 by adding elements such as Mg, Ca, Ti, Va, Cr to a lithium compound positive electrode composition since it would have reduced the decomposition of the electrolyte at the time of storage at high temperatures, improved the reduces the increases in inside resistance of the battery and enhanced the storing characteristics (abstract).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. FAX communications should be sent to the appropriate FAX number: (703) 872-9311 for After Final Responses only; (703) 872-9310 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregg Cantelmo  
Patent Examiner  
Art Unit 1745  
gc

  
June 17, 2003